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10/566,581	01/31/2006	Takehito Mizuno	Q92885	5116

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EXAMINER	
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1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Advisory Action:

Arguments are not persuasive for the following reasons:

Claim 18:

18. (currently amended): A zeolite tubular separation membrane comprising a porous tubular support with both ends open and a zeolite membrane which is formed on[[the]] a porous tubular support, wherein zeolite single crystals exposed on the surface of the membrane each have a growth axis almost perpendicular to the surface of the porous support, and wherein the membrane has grain boundary layers in spaces among the crystals exposed on the surface of the zeolite membrane.

Applicant's disclosure supporting the "grain boundary":

[0091] When crystals adjacent to those having grown perpendicularly to the porous tubular support continue to grow while colliding with them, the substances difficult for the zeolite crystals 81 to take in are concentrated on the crystal surface, resulting in the formation of grain boundary layers 82 between the zeolite crystals 81. The grain boundary layers 82 thus formed are made of oxides having a density larger than that of the zeolite crystals 81. Preferably, the thickness of the grain boundary layers 82 is about 5 to 50 nm. Preferably, pores larger in diameter than zeolite pores are not formed in the grain boundary layers 82. When pores with a large diameter are formed in the grain boundary layers 82, a good molecular sieve effect cannot be obtained. A zeolite membrane 8 including substantially dense grain boundary layers 82 exhibits a good molecular sieve effect.

[from the PGPUB; underline added by Examiner]

Teaching of the Lai reference, column 4, lines 1-

The dense mat of columnar zeolite crystals is intergrown in the membrane so that non-selective permeation paths through the membrane are blocked by the narrowest point of approach between crystals. Non-selective permeation pathways are permeation pathways which exist at room temperature that do not pass through the zeolite crystals. This blockage of nonpermeation pathways exists at room temperature after a template which occludes the pore structure is removed from the zeolite crystals. Templates which are used to grow the zeolite are often removed by a calcination step. From transmission electron microscopy (TEM) investigations, the narrowest point of approach between crystals of less than 20 .ANG. after the template is removed, can be established. The space between crystals at this point can contain inorganic oxide material that restricts non-selective permeation of molecules through the membrane.

This paragraph of the reference shows (1) crystals are columnar, (2) the space between the crystals is 20ANG., and (3) the interstice is filled with inorganic oxides that restricts non-selective permeation, which is the same as oxide with density larger than the zeolite as applicant discloses.

Thus applicant's alleged invention is not any different from what Lai teaches.

Regarding the Matsukata reference, applicant has not provided any evidence or reason why the grain boundary is not an inherent property of the zeolite. Also, Matsukata appears to teach the same synthesis process applicant uses.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/
Primary Examiner, Art Unit 1797